



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/630,022	07/30/2003	Daniel Edward Bowen III	DN2003-127	7760

7590 11/08/2005

The Goodyear Tire & Rubber Company
Patent & Trademark Department
D/823
1144 East Market Street
Akron, OH 44316-0001

EXAMINER

COSTALES, SHRUTI S

ART UNIT PAPER NUMBER

1714

DATE MAILED: 11/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/630,022

Applicant(s)

BOWEN ET AL.

Examiner

Shruti S. Costales

Art Unit

1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. All outstanding objections and rejections except for those described below are overcome by applicant's amendment filed September 6, 2005.
2. It is noted that claims 1-20 are currently pending. Applicant has amended claims 1-19, wherein, newly amended claim 1 now contains modified limitations of claims 2, 3, and 7. The combination of the newly added limitations to newly amended claim 1 was not before the Examiner previously, therein necessitating new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Claim Objections

3. Claim 7 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. More particularly, claim 7 recites the limitation that the silica is present in the range of 40 phr to 200 phr, which is the same limitation included in amended claim 1. Therefore, claim 7 fails to further limit claim 1 from which it depends. Applicant is required to cancel the claim, or amend the claim to place the claim in proper dependent form, or rewrite the claim in independent form.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior office action.

Art Unit: 1714

5. Claims 1-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lin et al. (U.S. Patent Number 6,608,145) in view of Asahara et al. (U.S. Patent Number 5,532,319).

Lin discloses a sulfur-vulcanizable elastomeric compound, comprising an elastomer polymerized in solvent, a reinforcing filler comprising silica or a mixture thereof with carbon black, a silica dispersing agent, a bis(trialkoxysilylorgano) tetrasulfide silica coupling agent, and a cure agent (Col. 3, lines 58-63 and Col. 11, lines 4-7). The sulfur-vulcanizable elastomeric compound is formed by mixing the elastomer, the silica, the bis(trialkoxysilylorgano) tetrasulfide silica coupling agent, and the silica dispersing aid (Col. 4, lines 1-4). The solvent is removed from the polymer or elastomer or rubber using conventional techniques (Col. 11, lines 26-30 and Col. 3, lines 9-10). Further, Lin discloses that the elastomer such as styrene-butadiene rubber are terminated with a tetraethoxysilane (TEOS) functionalizing agent to produce a TEOS-terminated polymer (Col. 14, lines 39-40). Silica dispersing agents such as alkyl alkoxysilanes may be used (Col. 2, lines 37-38). It is also disclosed that although the bis(trialkoxysilylorgano) tetrasulfides having methoxysilane groups can be used, it is preferred for environmental reasons that ethoxysilanes are employed, rather than methoxysilanes, because ethyl alcohol, rather than methyl alcohol, will be released when the alkoxysilane portion of the coupling agent reacts with the surface of the silica particle (Col. 4, lines 59-65).

The various components of sulfur-vulcanizable elastomeric compound are added at a temperature of 165° C to about 200° C and in a final mixing step the temperature is

Art Unit: 1714

within a preferred range of about 40° C to about 120° C (Col. 7, lines 60-67 and Col. 8, lines 1-41). Lin also discloses that the rubbers useful in the invention include synthetic polyisoprene rubber, styrene-butadiene rubber (SBR), styrene-isoprene-butadiene rubber, styrene-isoprene rubber, butadiene-isoprene rubber, polybutadiene, butyl rubber, neoprene, ethylene-propylene rubber, ethylene-propylene-diene rubber (EPDM), acrylonitrile-butadiene rubber (NBR), silicone rubber, the fluoroelastomers, ethylene acrylic rubber, ethylene vinyl acetate copolymer (EVA), epichlorohydrin rubbers, chlorinated polyethylene rubbers, chlorosulfonated polyethylene rubbers, hydrogenated nitrile rubber, tetrafluoroethylene-propylene rubber and the like (Col. 12, lines 31-43). More particularly, Lin discloses that 1,3-diene monomers are polymerized (Col. 9, lines 65-66) inherently including 1,3-butadiene. Precipitated silica is present in an amount of about 1 to about 100 phr (Col. 7, lines 18-30). The silica coupling agent, more particularly Si69® as indicated at Col. 3, lines 8-9, is present in an amount of 0 to 3 phr (see Table 5 at the bottom of Col. 16) and is present in an amount of 0.01% to about 1% by weight based on the weight of the silica (Col. 4, lines 30-46), wherein the wt% of the silica coupling agent disclosed is based on the amount of the silica, which is broad enough to intrinsically encompass an amount that is greater than 3 phr of the silica coupling agent. Resins can be used in an amount of 1 to 50 phr (Col. 13, lines 19-29).

The difference between Lin and the presently claimed invention is a specified weight average molecular weight of the end-group functionalized diene rubber.

Asahara, which is drawn to block copolymer composition (Col. 1, lines 7-16), discloses that the molecular weight of a rubber polymer treated with tetramethoxysilane has a molecular weight of 70,000 to 210,000 (Col. 14, lines 63-67; Col. 15, lines 1-5; and Table 2). It would have been obvious to one skilled in the art to use Asahara's rubber polymer treated with tetramethoxysilane having a molecular weight of 70,000 with Lin's compound because such a composition has high holding power and good heat resistance (Col. 17, lines 30-31 of Asahara) thereby obtaining the invention as set forth in the presently cited claims.

6. Claims 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Asahara as applied to claims 1-18 above, and further in view of the *Industrial Minerals and Their Uses – A Handbook & Formulary* by Noyes Publications (1996).

Precipitated silica is disclosed in Tables 1 and 2 of Lin. Although Lin does not explicitly disclose the particle size of the precipitated silica, the *Industrial Minerals and Their Uses* handbook discloses precipitated silica has particle sizes of 10 to 150 nm at pages 59-60 of the handbook. Therefore, the disclosed particle size of the precipitated silica is intrinsic to the precipitated silica of Lin, thereby obtaining the invention as set forth in the presently cited claim.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lin in view of Asahara as applied to claims 1-18 above, and further in view of Sandstorm et al. (U.S. Patent Number 6,378,582).

The difference between Lin in view of Asahara and the presently claimed invention is a specific tire.

On the one hand, attention is drawn to Col. 3, lines 51-54 and Col. 14, lines 5-16 where Lin specifically discloses a pneumatic tire "having a component" made from Lin's compound. It is reasonable to presume that a tire tread is encompassed by the disclosure of such a component. Hence Lin meets a tire tread made from a sulfur-vulcanizable elastomeric compound. On the other hand, with respect to the tire itself, Sandstorm discloses a tire which is comprised of a generally toroidal-shaped carcass with an outer circumferential tread, two spaced beads, at least one ply extending from bead to bead and sidewalls extending radially from and connecting said tread to said beads wherein said tread is adapted to be ground-contacting (Col. 5, lines 29-35 of Sandstorm). It would have been obvious to one skilled in the art to use the specific tire structure disclosed by Sandstorm with Lin's compound because the resulting tire would offer an excellent combination of traction, treadwear, and rolling resistance characteristics (Col. 5, lines 14-16 of Sandstorm), thereby obtaining the invention as set forth in the presently cited claim.

Response to Arguments

8. Applicant's arguments filed September 6, 2005 have been fully considered but they are not persuasive. Specifically, applicant argues that (a) the mixing temperature is not within the claimed range, (b) dispersing into the cement of a conventional rubbery polymer is not disclosed by the references, and (c) the weight average molecular weight of the end-group functionalized diene rubber are not disclosed.

With respect to the argument in (a), Lin discloses that the various components of sulfur-vulcanizable elastomeric compound are added at a temperature of 165° C to about 200° C and in a final mixing step the temperature is within a preferred range of about 40° C to about 120° C (Col. 7, lines 60-67 and Col. 8, lines 1-41). Therefore, at least the final mixing step temperatures overlap the presently claimed temperature range. Further, applicant's claim 1 is not limited in scope to the mixing of the disclosed components only because of the transitional phrase "comprising", which is open-ended. See M.P.E.P. § 2111.03. Further, the transitional term "comprising is inclusive or open-ended and does not exclude additional, unrecited elements or method steps. See, e.g., *Invitrogen Corp. v. Biocrest Mfg., L.P.*, 327 F.3d 1364, 1368, 66 USPQ2d 1631, 1634 (Fed. Cir. 2003) and *Genentech, Inc. v. Chiron Corp.*, 112 F.3d 495, 501, 42 USPQ2d 1608, 1613 (Fed. Cir. 1997).

With respect to the argument in (b), although Lin does not explicitly disclose a cement of a conventional rubbery polymer as required by the present claims, Lin discloses blending the elastomer having an alkoxysilane terminal group, silica, a coupling agent, which overlaps the mixing of the components presently claimed, wherein mixing intrinsically includes dispersing. Although the applicant's specification discloses that the cement includes a solvent, the present claims do not require a solvent contrary to the applicant's arguments. Therefore, Lin's dry blending overlaps the presently claimed invention.

With respect to the argument in (c), Asahara, which is drawn to a block copolymer composition (Col. 1, lines 7-16), discloses that the molecular weight of a

Art Unit: 1714

rubber polymer treated with tetramethoxysilane has a molecular weight of 70,000 to 210,000 (Col. 14, lines 63-67; Col. 15, lines 1-5; and Table 2). Although Asahara discloses block copolymers, both Lin and the present invention are drawn to copolymers generally. Asahara's block copolymers are a specific type of copolymers not necessarily excluded by the present claims. Further, it is to be noted that Asahara is used as a teaching reference, and therefore, it is not necessary for this secondary reference to contain all the features of the presently claimed invention, *In re Nievelt*, 482 F.2d 965, 179 USPQ 224, 226 (CCPA 1973) and *In re Keller*, 624 F.2d 413, 208 USPQ 871, 881 (CCPA 1981). Rather this reference teaches a certain concept, namely, that the use of a specific molecular weight of a rubber copolymer treated with tetramethoxysilane has high holding power and good heat resistance, and in combination with the primary reference, discloses the presently claimed invention.

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 1714

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shruti S. Costales whose telephone number is (571) 272-8389. The examiner can normally be reached on Monday - Friday, 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SSC
Shruti S. Costales
November 3, 2005

Vasu Jagannathan
VASU JAGANNATHAN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700